UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,054	08/08/2001	Hiroyuki Saito	0050-0094	6171

44987 7590 07/07/2006

HARRITY SNYDER, LLP
11350 Random Hills Road
SUITE 600
FAIRFAX, VA 22030

EXAMINER	
SHEW, JOHN	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/924,054	Applicant(s) SAITO, HIROYUKI	
	Examiner John L. Shew	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-4,6-8,10-12 and 14-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-4,6-8,10-12 and 14-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17, 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Kodialam et al. (Patent No. US 6538991 B1).

Claim 17, Kodialam teaches a method (network 300 of FIG. 3, constraint-based method of path determination based on capacities of network nodes ref. by Abstract lines 1-11), comprising specifying a when designing a network a boundary forming an area that includes a plurality of nodes making up the network (network 300 of FIG. 3, Network 300 with a boundary of Nodes N ref. by col. 5 lines 19-24), identifying a first one of the plurality of nodes that is proximate to the boundary as an ingress node to make incoming traffic available to other nodes in the network (source nodes S1 S2 S3 of FIG. 3, Source Node S1 of plurality S1 S2 S3 with associated available link l_{ij} capacitites ref. by col. 5 lines 36-67, col. 6 lines 1-5), identifying a second one of the plurality of nodes that is proximate to the boundary as an egress node to make outgoing traffic from the network available to another network (destination nodes D1 D2 D3 of FIG. 3,

Destination Node D1 of plurality D1 D2 D3 with associated available link l_{ij} capacitites ref. by col. 5 lines 36-67, col. 6 lines 1-5), identifying an incoming traffic rate for the ingress node (Step 401 of FIG. 4, the traffic rate of Label Switch Protocol request (o, t, bd) at step 401 ref. by col. 6 lines 18-24, col. 7 lines 15-18, lines 50-55), identifying an outgoing traffic rate for the egress node (Step 401 of FIG. 4, traffic rate of Label Switch Protocol request (o, t, bd) at step 401 ref. by col. 6 lines 18-24, col. 7 lines 15-18, lines 50-55), determining paths from the ingress node to the egress node that carry the incoming traffic via at least a subset of the plurality of nodes (Step 404 of FIG. 4, split demand programming system to allocate the LSP request over a set of paths to maximize the maxflow values θ_{sd} and θ_{ot} shown in step 404 ref. by col. 8 lines 30-54), calculating link capacities for the determined paths (FIG. 4, residual capacity vector R for the set of links ref. by col. 7 lines 15-40), and determining traffic capacities for the at least the subset of the plurality of nodes using the calculated link capacities (Step 404 of FIG. 4, step 404 programming to solve for a path based on the network G(N,L,B) constraints with the path route shown in equation (2) for each element (s,d) ref. by col. 8 lines 30-54, col. 9 lines 15-23).

Claim 18, Kodialam teaches identifying a third one of the plurality of nodes proximate to the boundary as a second ingress node to make second incoming traffic available to other nodes in the network (Source Node S2 of FIG. 3, Source Node S2 of plurality S1 S2 S3 with associated available link l_{ij} capacitites ref. by col. 5 lines 36-67, col. 6 lines 1-5), identifying a second incoming traffic rate for the second ingress node (ingress-egress pair (S2,D2) of FIG. 3, the ingress-egress pair (S2,D2) and their bandwidth

capacity ref. by col. 5 lines 36-67,col. 6 lines 1-17), determining paths from the second ingress node to the egress node that carry the second incoming traffic via certain of the at least the subset of the plurality of nodes (Step 404 of FIG. 4, split demand programming system to allocate the LSP request over a set of paths to maximize the maxflow values θ_{sd} and θ_{ot} shown in step 404 ref. by col. 8 lines 30-54), calculating link capacities for the determined paths from the second ingress node (FIG. 4, residual capacity vector R for the set of links ref. by col. 7 lines 15-40), and determining traffic capacities for the certain of the at least the subset of the plurality of nodes using the calculated link capacities (Step 404 of FIG. 4, step 404 programming to solve for a path based on the network G(N,L,B) constraints with the path route shown in equation (2) for each element (s,d) ref. by col. 8 lines 30-54, col. 9 lines 15-23).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 2, 4, 7, 6, 8, 11, 10, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benmohamed et al. (Patent No. US 6795399 B1) in view of Mitra et al. (Patent number US 6721270 B1).

Claim 3, Benmohamed teaches a communication network designing circuit for multiple point communication service (apparatus for designing IP networks for optimistic link

capacity requirements ref. by Abstract lines 1-8), for permitting arbitrary communication within a predetermined range (upper and lower link capacity bounds ref. by column 2 lines 5-10), by providing traffic flowing in from an ingress node through which data flows in from another network (Step 502 of FIG. 5, input VPN demands for a given link Step 502 ref. by column 14 lines 13-25), and traffic flowing out from an egress node through which data is fed to the other network (Step 508 of FIG. 5, output link capacity C_l^{WFQ} for link l of all VPN demands routed through link l Step 508 wherein the V set of nodes corresponding to points of presence is the initial backbone network topology of traffic flow ref. by column 14 lines 25-33, column 4 lines 21-31), comprising setting means for setting a mathematical programming problem for deriving said multiple point communication service (Worst-Case Link Capacity Requirements Processor 14 of FIG. 1, FIG. 2, Worst-Case Link Capacity Requirements Processor 14 which sets the input link requirements and the optimization based on equation (5) ref. by column 5 lines 12-23, column 7 lines 30-35), to permit arbitrary communication within the predetermined range (upper and lower link capacity bounds for the predetermined range ref. by column 2 lines 5-10), per-user necessary link capacity calculating condition generating means for generating a constraint expression for calculating a necessary link bandwidth for each link carrying traffic flowing in from each ingress node (Steps 402-404 of FIG. 4, user-selected congestion scenario and worst-case link capacity requirements Step 402 for generating constraints (H^{best}, H^{hop}, H^{one}) to compute the bandwidth of Optimistic Link Capacity Step 404 for each link l inclusive of incoming node traffic ref. by col. 13 lines 29-56), and link including condition generating means for generating a constraint

expression so as not to exceed a link capacity limit in each link (limits of upper and lower bounds of capacities as a function of H^{hop} and H^{one} as shown in equations (17)-(20) ref. by col. 12 lines 7-24), and optimizing means for solving the mathematical programming problem set by said setting means (Network Topology Optimization Processor 18 of FIG. 1, FIG.2, Network Topology Optimization Processor 18 calculating the network cost to obtain the final network design ref. by column 5 lines 23-29), and obtaining a path for said multiple point communication service (FIG. 2, resulting route of each traffic flow f_i ref. by column 5 lines 28-33). Benmohamed does not teach an optimization reference generating means for setting objective function for minimizing a link load.

Mitra teaches an optimization reference generating means for setting objective function for minimizing a link load (Steps 20 25 of FIG. 2, Solve Multi-Commonality Flow to Maximize QoS Network Revenue step 20 followed by Solve MCF to Minimize Resource Usage step 25 wherein the resource usage is summed over the links l ref. by col. 5 lines 45-67, col. 6 lines 1-47), in an object network coupled to the other network (FIG. 2, Residual Network Topology which is coupled to the current network being optimized ref. by col. 6 lines 55-67), and serving as an optimization reference and setting a constraint expression for deriving said link load (Step 35 of FIG. 2, Residual Network which serves as a reference of remaining capacities for optimization through Solving Link-Based MCF to Maximize BE Revenue step 35 ref. by col. 6 lines 55-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the multicommodity flow method of Mitra to the link capacity

computation method of Benmohamed for the purpose of solving traffic engineering problems in a network having at least one QoS service class and at least one class of service that is not a QoS class as suggested by Mitra (col. 3 lines 21-24).

Claim 2, Benmohamed teaches wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard (input to the IP network design system the IP flow demand specified by f_i given as a 6-tuple $f_i=(s_i, t_i, a_i, n_i, d_i, r_i)$ where s_i and t_i are the source and destination nodes for the path and f_i as the input standard ref. by column 4 lines 21-45).

Claim 4, Benmohamed teaches wherein the optimization reference generating means, the per-user necessary link capacity calculating condition generating means and the link including condition generating means operate in parallel with respect to each other (FIG. 1, Congestion Scenario (Ho) providing parallel inputs to the Worst-Case Link Capacity Requirements Processor 14 and the Optimistic Link Capacity Design Processor 16 ref. by col. 4 lined 3-20).

Claim 7, Benmohamed teaches a communication network designing method for multiple point communication service (apparatus for designing IP networks for optimistic link capacity requirements ref. by Abstract lines 1-8), for permitting arbitrary communication within a predetermined range (upper and lower link capacity bounds ref. by column 2 lines 5-10), by providing traffic flowing in from an ingress node through which data flows in from another network (Step 502 of FIG. 5, input VPN demands for a given link Step 502 ref. by column 14 lines 13-25), and traffic flowing out from an egress node through which data is fed to the other network (Step 508 of FIG. 5, output link

capacity C_l^{WFQ} for link l of all VPN demands routed through link l Step 508 wherein the V set of nodes corresponding to points of presence is the initial backbone network topology of traffic flow ref. by column 14 lines 25-33, column 4 lines 21-31), comprising setting a mathematical programming problem for deriving said multiple point communication service (Worst-Case Link Capacity Requirements Processor 14 of FIG. 1, FIG. 2, Worst-Case Link Capacity Requirements Processor 14 which sets the input link requirements and the optimization based on equation (5) ref. by column 5 lines 12-23, column 7 lines 30-35), to provide arbitrary communication within the predetermined range (upper and lower link capacity bounds for the predetermined range ref. by column 2 lines 5-10), the setting comprising generating a constraint expression for calculating a necessary link bandwidth of each link carrying traffic flowing in from each ingress node (equation (5) the minimum link capacity c_l^{FIFO} ref. by col. 7 lines 30-35), and generating a constraint expression so as not to exceed a link capacity limit in each link (limits of upper and lower bounds of capacitites as a function of H^{hop} and H^{one} as shown in equations (17)-(20) ref. by col. 12 lines 7-24), solving the mathematical programming problem set by said setting (Network Topology Optimization Processor 18 of FIG. 1, FIG.2, Network Topology Optimization Processor 18 calculating the network cost to obtain the final network design ref. by column 5 lines 23-29), and obtaining a path for said multiple point communication service (Step 210 of FIG. 2, the Output Final Design with resulting route of each traffic flow f_i of column 5 lines 28-33). Benmohamed does not teach setting an objective function for minimizing a link load in an object network

operatively coupled to the other network and where the objective function services as an optimization reference.

Mitra teaches setting objective function for minimizing a link load (Steps 20 25 of FIG. 2, Solve Multi-Commonality Flow to Maximize QoS Network Revenue step 20 followed by Solve MCF to Minimize Resource Usage step 25 wherein the resource usage is summed over the links I ref. by col. 5 lines 45-67, col. 6 lines 1-47), in an object network operatively coupled to the other network (FIG. 2, Residual Network Topology which is coupled to the current network being optimized ref. by col. 6 lines 55-67), and where the objective functions serves as an optimization reference (Step 35 of FIG. 2, Residual Network which serves as a reference of remaining capacities for optimization through Solving Link-Based MCF to Maximize BE Revenue step 35 ref. by col. 6 lines 55-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the multicommodity flow method of Mitra to the link capacity computation method of Benmohamed for the purpose of solving traffic engineering problems in a network having at least one QoS service class and at least one class of service that is not a QoS class as suggested by Mitra (col. 3 lines 21-24).

Claim 6, Benmohamed teaches wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard (input to the IP network design system the IP flow demand specified by f_i given as a 6-tuple $f_i=(s_i, t_i, a_i, n_i, d_i, r_i)$ where s_i and t_i are the source and destination nodes for the path and f_i as the input standard ref. by column 4 lines 21-45).

Claim 8, Benmohamed teaches wherein the setting objective function the setting a constraint expression the generating a constraint expression for calculating and the generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel with respect to each other (FIG. 1, Congestion Scenario (Ho) providing parallel inputs to the Worst-Case Link Capacity Requirements Processor 14 and the Optimistic Link Capacity Design Processor 16 ref. by col. 4 lined 3-20).

Claim 11, Benmohamed teaches a storage medium storing a communication network design control program (CPU RAM and software instructions to perform the methodology ref. by column 3 lines 20-40), for designing a communication network for multiple point communication service (method for designing IP networks for optimistic link capacity requirements ref. by Abstract lines 1-8), for permitting arbitrary communication within a predetermined range (upper and lower link capacity bounds ref. by column 2 lines 5-10), by providing traffic flowing in from an ingress node through which data flows in from an other network (Step 502 of FIG. 5, input VPN demands for a given link Step 502 ref. by column 14 lines 13-25), and traffic flowing out from an egress node through which data is fed to the other network (Step 508 of FIG. 5, output link capacity C_l^{WFQ} for link l of all VPN demands routed through link l Step 508 wherein the V set of nodes corresponding to points of presence is the initial backbone network topology of traffic flow ref. by column 14 lines 25-33, column 4 lines 21-31), said communication network design control program comprising setting a mathematical programming problem for deriving said multiple point communication service (Step 304 of FIG. 3, input of point-to-point VPN demands and computation of worst-case line

capacity Step 304 ref. by column 5 lines 12-23, column 12 lines 38-53), to provide arbitrary communication within the predetermined range (upper and lower link capacity bounds for the predetermined range ref. by column 2 lines 5-10), the setting comprising setting a constraint expression for deriving a link load (constraint minimum link capacity c_l^{FIFO} ref. by col. 7 lines 25-35), generating a constraint expression for selecting a route for traffic flowing in from the other network (IP flow demand f_i which has a route based on source s and destination t wherein the constraint is the share of link capacity r^l_i ref. by col. 4 lines 21-48, col. 6 lines 34-55), generating a constraint expression for calculating a necessary link bandwidth of each link carrying traffic flowing in from each ingress node (link l* which is the bottleneck link for demand I used for determination of link capacity C_l^{FIFO} equation (8) ref. by col. 9 lines 12-26), and generating a constraint expression so as not to exceed a link capacity limit in each link (upper bound capacity $C_l^{FIFO}(H^{max})$ based on the max of all links ref. by col. 9 lines 27-33), solving the mathematical programming problem set in said setting step (Network Topology Optimization Processor 18 of FIG. 1, FIG.2, Network Topology Optimization Processor 18 calculating the network cost to obtain the final network design ref. by column 5 lines 23-29), and obtaining a path for said multiple point communication service (Step 210 of FIG. 2, Output Final Design with resulting route of each traffic flow f_i ref. by column 5 lines 28-33).

Claim 10, Benmohamed teaches further comprising deriving said path for said multiple point communication service on the basis of a preliminarily set optimization standard (input to the IP network design system the IP flow demand specified by f_i given as a 6-

tuple $f_i=(s_i, t_i, a_i, n_i, d_i, r_i)$ where s_i and t_i are the source and destination nodes for the path and f_i as the input standard ref. by column 4 lines 21-45).

Claim 12, Benmohamed teaches wherein the setting a constraint expression the generating a constraint expression for selecting a route the generating a constraint expression for calculating a necessary link bandwidth and the generating a constraint expression operate in parallel with respect to each other (FIG. 1, Congestion Scenario (Ho) providing parallel inputs to the Worst-Case Link Capacity Requirements Processor 14 and the Optimistic Link Capacity Design Processor 16 ref. by col. 4 lined 3-20).

Claims 15, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benmohamed, in view of Debey (Patent No. US 6519693 B1).

Claim 15, Benmohamed teaches a communication network design control program (CPU RAM and software instructions to perform the methodology ref. by column 3 lines 20-40), for designing a communication network for multiple point communication service (method for designing IP networks for optimistic link capacity requirements ref. by Abstract lines 1-8), for permitting arbitrary communication within a predetermined range (upper and lower link capacity bounds ref. by column 2 lines 5-10), by providing traffic flowing in from an ingress node through which data flows in from an other network (Step 502 of FIG. 5, input VPN demands for a given link Step 502 ref. by column 14 lines 13-25), and traffic flows out from an egress node through which data is fed to the other network (Step 508 of FIG. 5, output link capacity C_l^{WFQ} for link l of all VPN demands routed through link l Step 508 wherein the V set of nodes corresponding to points of

presence is the initial backbone network topology of traffic flow ref. by column 14 lines 25-33, column 4 lines 21-31), said communication network design control program comprising setting a mathematical programming problem for deriving said multiple point communication service (column 5 lines 12-23, Step 304 of FIG. 3, input of point-to-point VPN demands and computation of worst-case line capacity Step 304 ref. by column 5 lines 12-23, column 12 lines 38-53), to provide arbitrary communication within the predetermined range (upper and lower link capacity bounds for the predetermined range ref. by column 2 lines 5-10), the setting comprising setting a constraint expression for deriving said link load (constraint minimum link capacity c_l^{FIFO} ref. by col. 7 lines 25-35), generating a constraint expression for calculating a necessary link bandwidth of each link carrying traffic flowing in from each ingress node (link l* which is the bottleneck link for demand I used for determination of link capacity C_l^{FIFO} equation (8) ref. by col. 9 lines 12-26), and generating a constraint expression so as not to exceed a link capacity limit in each link (upper bound capacity $C_l^{FIFO}(H^{max})$ based on the max of all links ref. by col. 9 lines 27-33), solving the mathematical programming problem set in said setting (Network Topology Optimization Processor 18 of FIG. 1, FIG.2, Network Topology Optimization Processor 18 calculating the network cost to obtain the final network design ref. by column 5 lines 23-29), and obtaining a path for said multiple point communication service (Step 210 of FIG. 2, Output Final Design with resulting route of each traffic flow f_i ref. by column 5 lines 28-33). Benmohamed does not teach a transmission medium transmitting a communication program.

Debey teaches a transmission medium transmitting a communication program (FIG.2, CATV network for program transmission ref. by column 2 lines 40-46, column 3 lines 46-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to transmit the network design program of Benmohamed over an information network as suggested by Debey for the purpose of increasing greater accessibility to information required to be accessed by more than one person at the same time (Debey column 1 lines 33-40).

Claim 14, Benmohamed teaches said communication network design control program operates said computer for obtaining said path for said multiple point communication service is on the basis of a preliminarily set optimization standard (input to the IP network design system the IP flow demand specified by f_i given as a 6-tuple $f_i=(s_i, t_i, a_i, n_i, d_i, r_i)$ where s_i and t_i are the source and destination nodes for the path and f_i as the input standard ref. by column 4 lines 21-45).

Claim 16, Benmohamed teaches wherein the setting a constraint expression the generating a constraint expression the operating said computer for generating a constraint expression for calculating a necessary link bandwidth and the operating said computer for generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel with respect to each other (FIG. 1, Congestion Scenario (Ho) providing parallel inputs to the Worst-Case Link Capacity Requirements Processor 14 and the Optimistic Link Capacity Design Processor 16 ref. by col. 4 lined 3-20).

Response to Arguments

3. Applicant's arguments filed 5/31/2006 have been fully considered but they are not persuasive. The examiner respectfully traverses the arguments presented.

Regarding amended claim 17, the addition of limitation "when designing a network" does not differentiate from the prior art of Kodialam. Kodialam teaches "designing a network" through a constraint-based routing method to determine a path through a network for a requested label-switched path. As such, the process of path determination is a part of a network design function.

The limitation of "a network a boundary forming an area that includes a plurality of nodes" is taught by Kodialam in Fig. 2 in terms of the input sources and the output destinations. The network 300 itself forms a boundary since there are fixed inputs and fixed outputs.

Regarding claim 18, the rejection is maintained as claim 18 depends on claim 17 which is rejected.

Regarding claim 3, the limitation "setting means for setting a mathematical programming problem for deriving said multiple point communication service" is taught by Benmohamed through the Worst-Case Link Capacity Requirements Processor 14 of FIG. 1 which sets the input link requirements and the optimization based on equation (5) the minimum link capacity (col. 7 line 30), further the limitation "permit arbitrary

communication within the predetermined range" is taught by the upper and lower link capacity bounds identified by Benmohamed in col. 2 lines 5-10

In a first aspect of the invention, methods and apparatus are provided for computing link capacity requirements of the links of the network. Particularly, upper and lower link capacity bounds are computable to provide the user of the design methodology with worst-case and optimistic results as a function of various design parameters.

Such upper and lower link capacity bounds form a range to which the network is designed and corresponds to the worst-case link capacity requirements processor 14 and optimistic link capacity design processor 16 of Fig. 1 .

The setting means for setting a mathematical programming problem is taught by Benmohamed through the Worst-Case Link Capacity Requirements Processor 14 with detail elaboration by Step 304 of Fig. 3 as to the mathematical equations involved, particularly summarized by equation (5).

The limitation " optimizing means for solving the mathematical programming problem" is taught by Benmohamed by the Network Topology Optimization Processor 18 of FIG. 1. Benmohamed cites (Fig. 2, col. 5 lines lines 23-29)

Third, the design system determines whether the final network design (by optimization processor 18) is obtained (step 206). If not, in step 208, the network topology is perturbed (by optimization processor 18) and the new network cost is evaluated in accordance with steps 202 and 204.

These series of steps corresponds to an optimization to obtain a final network design based on link capacity requirements.

It is agreed that Benmohamed does not disclose “an optimization reference generating means for setting objective function for minimizing a link load”. This limitation is taught by Mitra. Mitra teaches optimization reference generating means for setting objective function for minimizing a link load from Fig. 2. The Solve Multi-Commonality Flow to Maximize QoS Network Revenue step 20 followed by Solve MCF to Minimize Resource Usage step 25 wherein the resource usage is summed over the links l. The Solve MCF to minimize resource usage of step 25 constitutes a function to minimize a link load.

Regarding claims 2 and 4, the rejection is maintained as the independent claim 3 remains rejected.

Regarding claim 7, the limitation “setting a mathematical programming problem” is already addressed based on the analogous claim 3 above.

Regarding claims 6 and 8, the rejection is maintained as the independent claim 7 remains rejected.

Regarding claim 11, the limitation "setting a mathematical programming problem" is already addressed based on the analogous claim 3 above.

Regarding claims 10 and 12, the rejection is maintained as the independent claim 7 remains rejected.

Regarding claim 15, the limitation "setting a mathematical programming problem" is already addressed based on the analogous claim 3 above.

Regarding claims 14 and 16, the rejection is maintained as the independent claim 7 remains rejected.

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John L. Shew whose telephone number is 571-272-3137. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

js

Seema S. Rao 6/29/06
SEEMA S. RAO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600